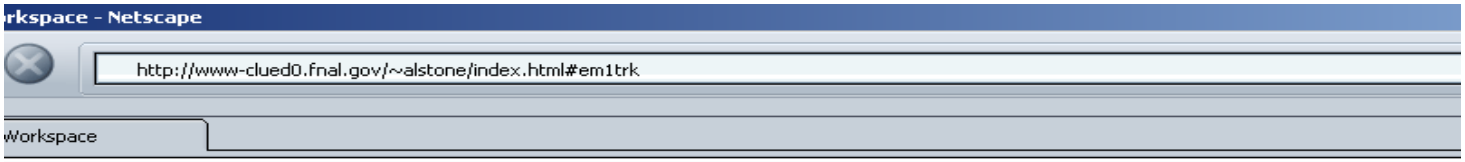
Recent Projects

- Athena
  - EM1TRK, Bad Runs, Luminosity, Skimming
- L1 CAL Upgrade – BLS-to-ADF Transition System & Test Stand
  - New racks & cable mock-up
  - Schematics and layouts
  - Wiring & cable labelling

Athena

- V01-05-02 – tagged 26 June 2004
  - Includes changes made by Suyong, Alan and James
    - 3 Jet branches
      - JES corrected
      - JES+Muon corrected
      - Uncorrected – for Jet Reco studies
    - L1, L2 and L3 trigger branches for efficiency studies
    - Track, electrons, vertexing, missing ET
    - D0correct v00-00-06
  - Compiled with p14.06.00, maxopt
- Next version (p16.04, integrated d0correct)
  - Nearly ready, but no significant code changes
  - Will need once the pass2 skims are available

TMB Pass1 EM1TRK Skim



p14 1EMTRK

21 April 2004 - 28 June 2004 (Runs 192165 - 194566)					
Skim	SAM Dataset	# Files	# Events	Subsets by Tape	Job Script
EM1TRK	p14.em1trk.post.02	254	9,377,349	45	run_em1trk.post_apr2004
25 November 2003 - 21 April 2004 (Runs 185746 - 192159)					
Skim	SAM Dataset	# Files	# Events	Subsets by Tape	Job Script
EM1TRK	p14.em1trk.post.01	665	12,280,693	158	run_em1trk.post_nov2003
20 April 2002 - 7 September 2003 (Runs 151816 - 180956)					
Skim	SAM Dataset	# Files	# Events	Subsets by Tape	Job Script
EM1TRK	p14.em1trk.01	765	32,137,764	142	run_em1trk
4 October - 6 December 2002 (Runs 165600 - 168954)					
Skim	SAM Dataset	# Files	# Events	Subsets by Tape	Job Script
EM1TRK	p14.em1trk.catch.r13	14	653,723	NA	run_em1trk_r13

This section was last modified on Thu Aug 26 16:06:15 CDT 2004.

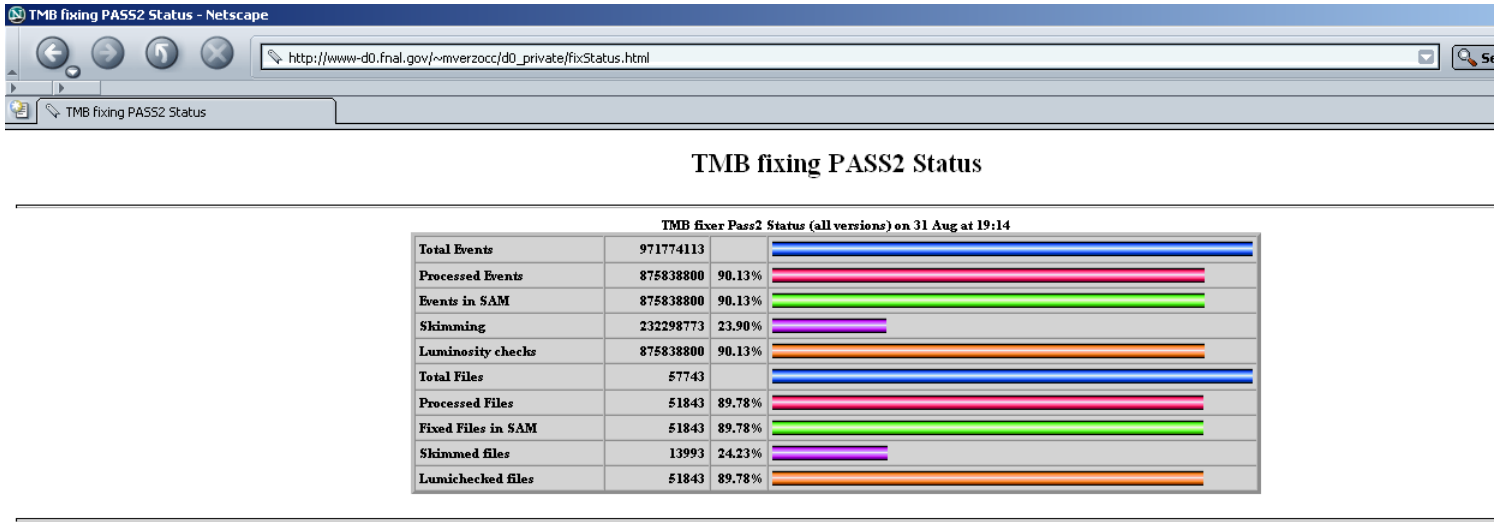
Use python script to create SAM dataset definitions by tape & job script. Easier to keep track of completed jobs or restart failed jobs.

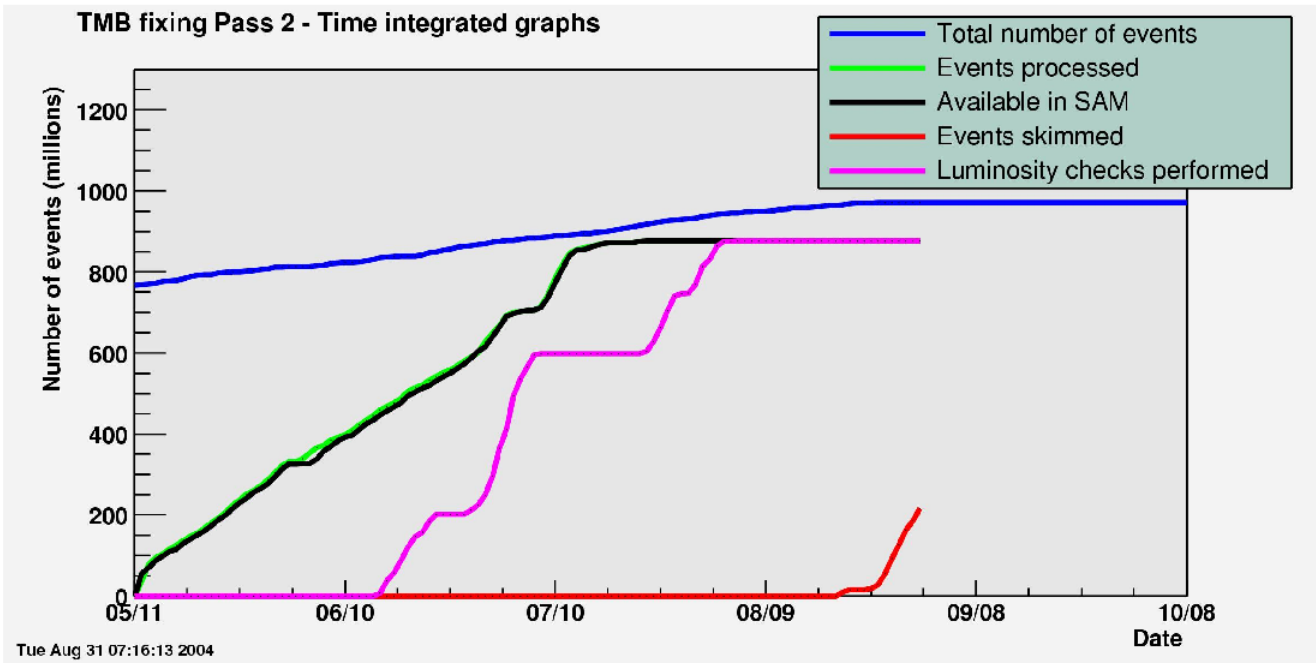
Another script does the bookkeeping.

TMB Pass2 Fixing & Skimming

Pass2 will include t42 corrections.

Fixing is nearly complete, but skimming is not.





EM1TRK Athena root-tuples

http://www-d0.fnal.gov/~alstone/D0Work/athena.html#p14data

- Current status of the p14 EM1TRK root-tuples:

All EM1TRK: 20 April 2002 - 28 June 2004 (Runs 151817 - 194566)					
Athena	# Events	# Root-tuples	Disk Space	Avg Event Size	Macro Chain
v01-05-02	54,431,899	803	309.27 Gb	5.68 kb	run_em1trk_all_skim.C
21 April 2004 - 28 Jun 2004 (Runs 192165 - 194566)					
Location: /rooms/flames/Athena/v01-05-02/em1trk-post-apr2004/					
Athena	# Events	# Root-tuples	Disk Space	Avg Event Size	Macro Chain
v01-05-02	9,377,349	133	58.98 Gb	6.29 kb	run_em1trk_post_apr2004_skim.C
25 November 2003 - 21 April 2004 (Runs 185746 - 192159)					
Location: /rooms/flames/Athena/v01-05-02/em1trk-post-nov2003/					
Athena	# Events	# Root-tuples	Disk Space	Avg Event Size	Macro Chain
v01-05-02	12,263,063	369	71.05 Gb	5.79 kb	run_em1trk_post_nov2003_skim.C
20 April 2002 - 7 September 2003 (Runs 151817 - 180956)					
Location: /rooms/flames/Athena/v01-05-02/em1trk/					
Athena	# Events	# Root-tuples	Disk Space	Avg Event Size	Macro Chain
v01-05-02	32,137,764	291	175.86 Gb	5.47 kb	run_em1trk_skim.C
4 October - 6 December 2002 (Runs 165600 - 168954)					
Location: /rooms/flames/Athena/v01-05-02/em1trk_r13/					
Athena	# Events	# Root-tuples	Disk Space	Avg Event Size	Macro Chain
v01-05-02	653,723	10	3.37 Gb	6.29 kb	run_em1trk_r13_skim.C

- Root-tuples produced by both James and Alan
- Runs 151817-194566 – through v12 trigger list – taken 20 Apr 2002 – 28 Jun 2004
- 54.4 million events – less than 0.1% duplication
- 803 root-tuples using 309 Gb of disk space – average 5.7 kb event size

- Effort was made to reduce event size from 10.6 to 5.7 kb while adding new information for the trigger

Bad Runs Page

Bad Runs & Bad LBNs

- Used Run Quality Database to compile a list of bad runs based on detector criteria for CAL, CFT and SMT
  - Not perfect. About half are non-physics runs. There is no easy mechanism to remove non-physics runs from the list.
  - 1213 bad runs in aggregate, but only ~650 are physics runs
- Removed early runs for which the L1 CAL trigger did not have full central calorimeter coverage
  - Additional 24 runs not already flagged bad by CAL, CFT and SMT
- Bad LBN list from CalJetMet quality
  - Without t42 - using one list for Runs 151817 -180956 and another list for Runs 185746 - 194566 (last v12 run)
- Run 161977 (15 Aug 2002) is the first "good" run with non-zero luminosity for a single EM high-pT trigger to be used in our analysis

Luminosity

- **Run Range Luminosity method for diEM trigger**

	EM1TRK		
	E1_2L20	2EM_HI	Diem Total
Delivered	246.7256 pb-1	178.944 pb-1	425.6696 pb-1
Recorded (all)	227.2635 pb-1	150.122 pb-1	377.3855 pb-1
Recorded (good)	201.4615 pb-1	119.354 pb-1	320.819 pb-1

- **Method to OR multiple unprescaled single EM triggers**
  - Same bad run and bad LBN lists. Same run range. Same skim.

Single EM Lumi Results	
First Run	161977
Last Run	194566
Recorded	321.967 pb^{-1}

Skimming Athena Root-tuples

- **It will take 10-12 hours to process the 54 million events and 803 root-tuples to make histograms**
  - **Sometimes this is a necessary evil when doing efficiencies or optimizing cut, but for most work, you don't need this full dataset**

Data: 20 April 2002 - 28 June 2004 (Runs 151817 - 194566)				
Location: /rooms/flames/alstone/skims/v01-05-02/em1trk/				
Cuts: 1 EM object with emf>0.9, iso<0.15, hmx7<12, Track Match, CC-only				
Athena	Macro	# Original Events	# Skimmed Events	# Skimmed Root-tuples
v01-05-02	run_em1trk_skim.C	54,431,899	1,784,949	7
Cuts: 1 EM object with emf>0.9, iso<0.15, Track Match, pT>25				
Athena	Macro	# Original Events	# Skimmed Events	# Skimmed Root-tuples
v01-05-02	run_em1trk_skim.C	54,431,899	1,374,437	7

- Note: The EM1TRK skim requires at least one EM object with pT > 8 GeV.
- Note: An EM fraction greater than 90% is already required for the leading EM object(s) with ID=10 or 11 in the EM skims - 1EMloose, EM1TRK, 2EM, 2EMhighpt.

Miscellaneous Details

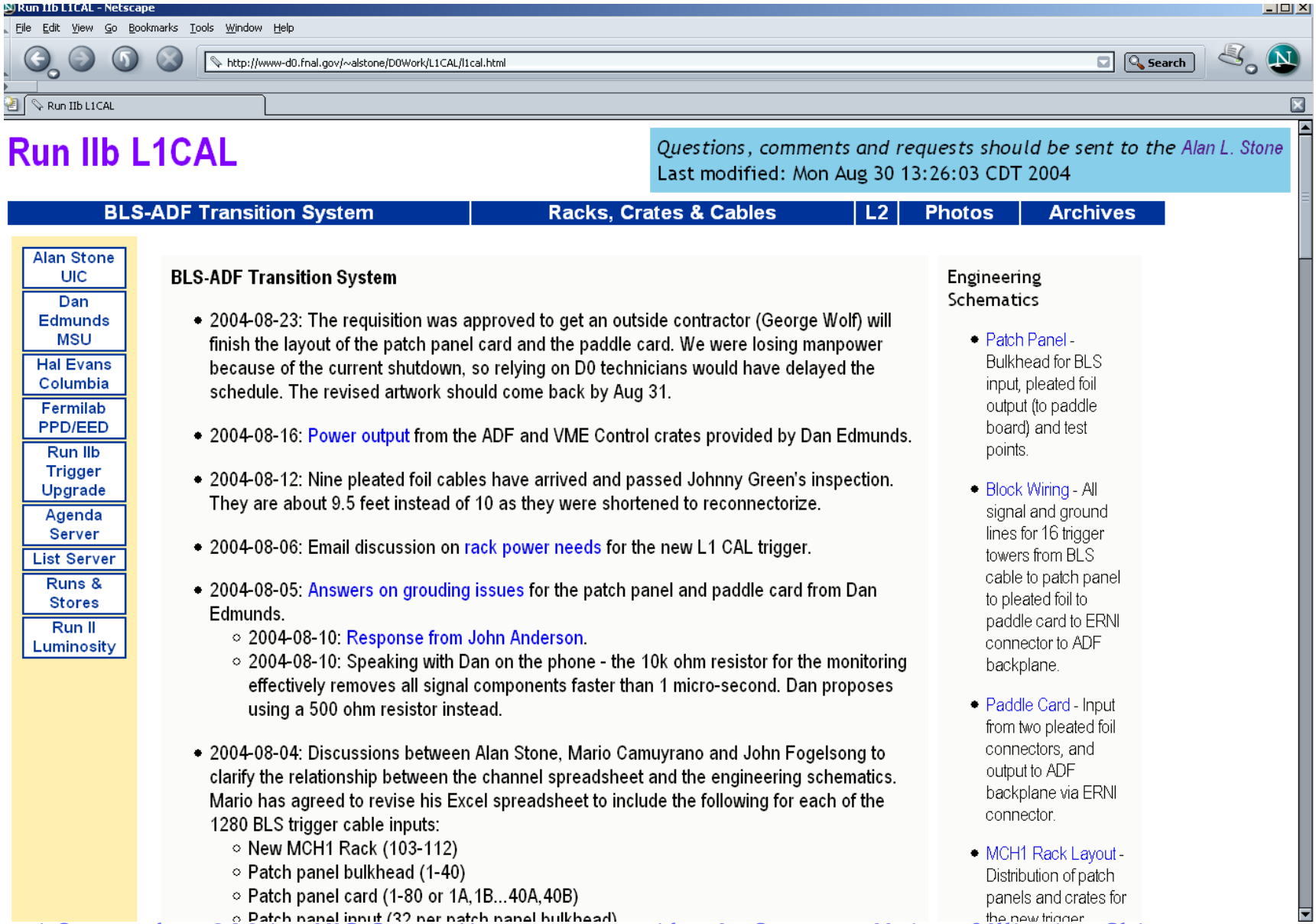
- Looking at the L1, L2 and L3 trigger cross sections run by run for anomalies
  - Have some preliminary numbers and plots, but will reserve that material for another week
- Sent email to database group for method to AND store and physics trigger list meta data with run quality
- Sent email to D0 Higgs group with details on EM1TRK skimmed thumbnails, Athena root-tuples and luminosity summary
  - Invitation for others to use
- Keeping up with Data Format Working Group
  - Will eventually make Athena root-tuples obsolete
- Optimization of electron cuts (hmx7 for example) for Z+jets analysis

L1 CAL Upgrade

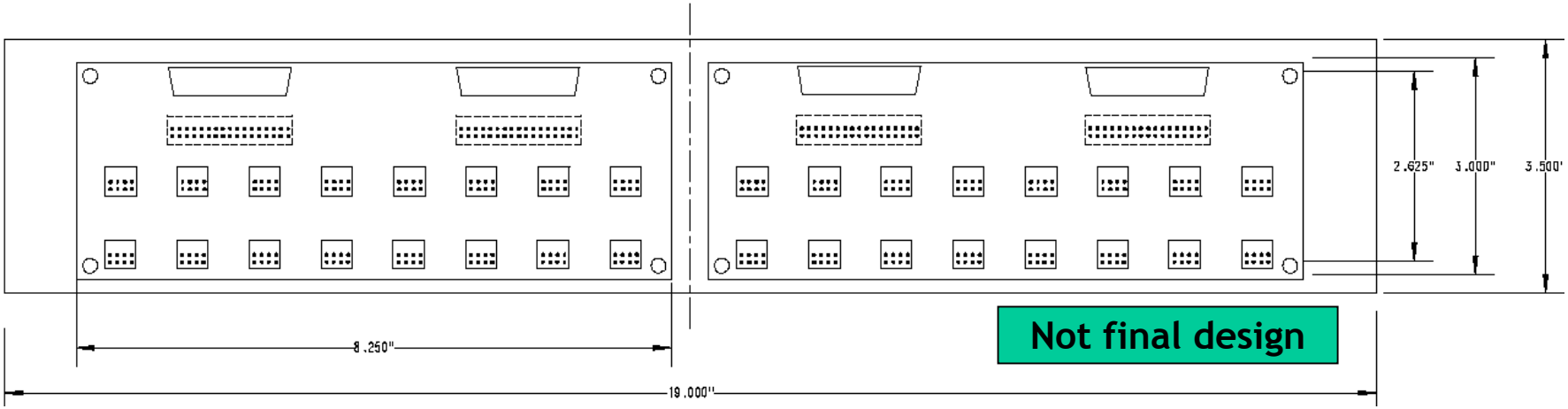
BLS-to-ADF Transition System

- Pass signal from existing 1280 BLS trigger cables to new ADF crate backplanes
  - Fully documented in pending D0 Note
- Need careful mapping of each conductor - signal and ground
  - Mario has a massive spreadsheet
- New rack layout for MCH1
  - Cooling is still a concern. Existing cables major constraint.
- Require rigorous testing of all new passive electronics and cables
  - Prototype cables are here. Patch panel and paddle cards are in the last stage of layout. Should have stuffed boards in <10 days.
- Mock-up of patch panels and cables to understand cable flow and strain relief, cable lengths, etc.
  - Already have new racks, patch panel templates, scrap cables
- Relabel existing BLS cables - new destination
  - Provide outside company with format and text

My L1 CAL Web Page

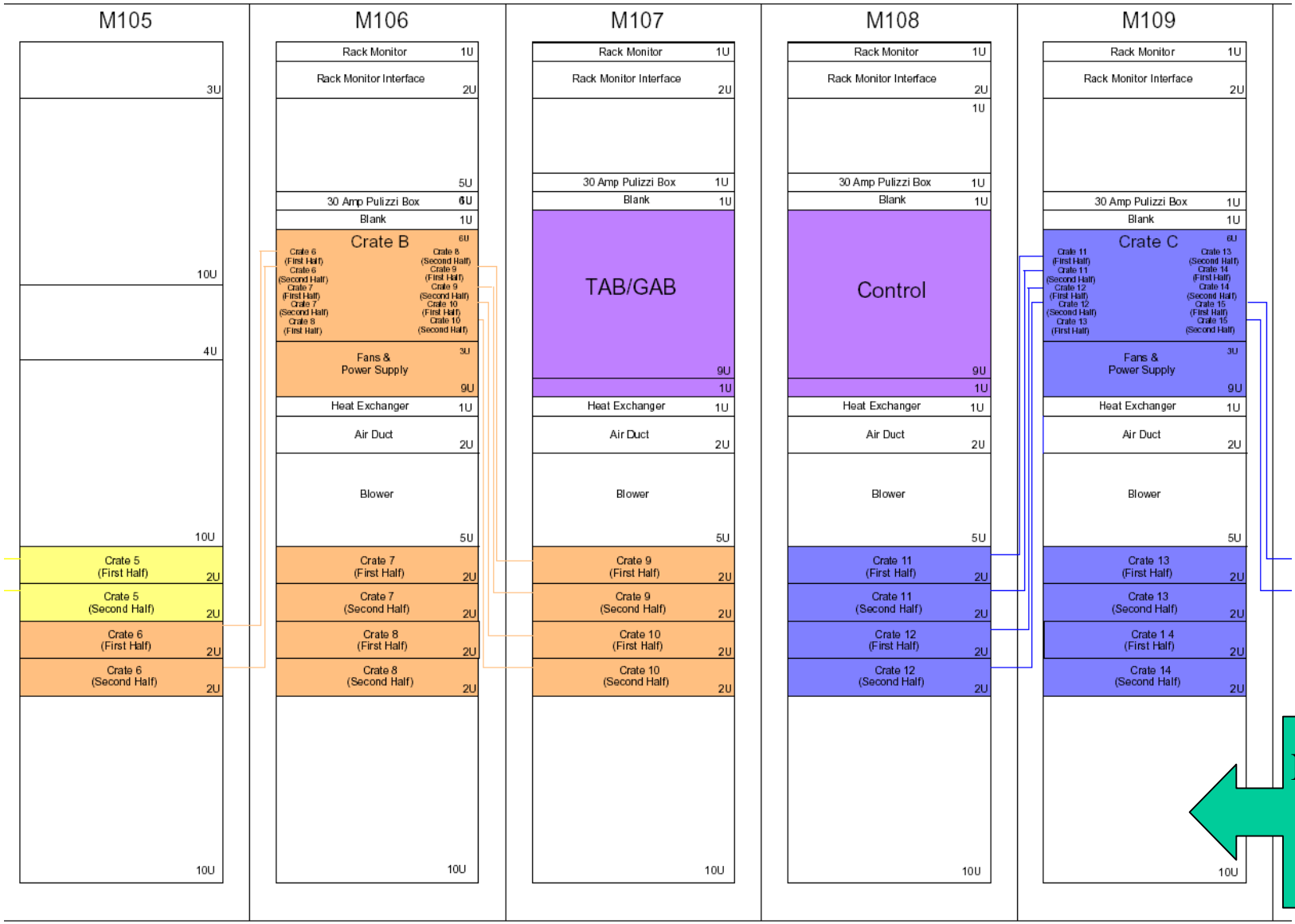


Patch Panel

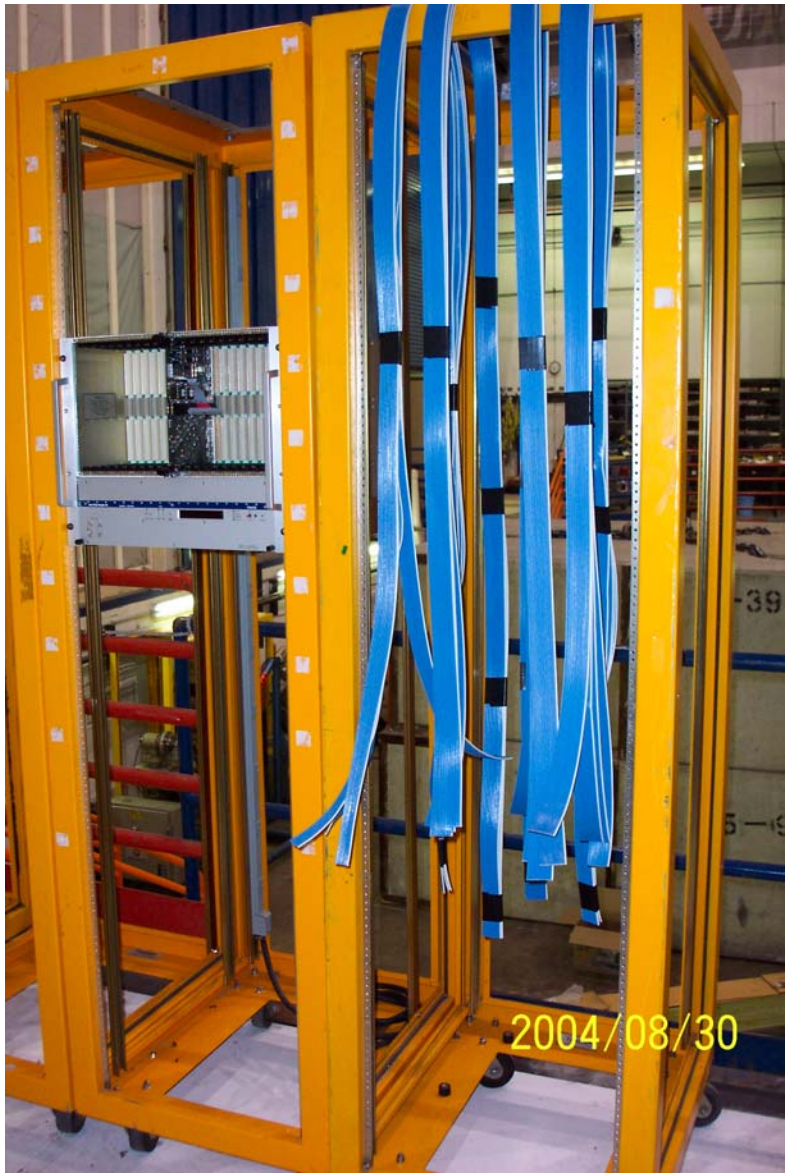


- **Need 40 Patch Panels (PP) - four in each rack.**
  - We are considering mounting the PP to a drawer.
  - Two patch panel cards (PPC) - stuffed printed circuit boards - for each PP. The cables plug into the connectors from inside.
  - 16 BLS input cables - for each trigger tower (TT) - and 2 pleated foil output cables for each ADF.
  - 4 monitor connectors accessible from outside. Expert can plug in a scope (even during physics data taking!) to monitor or debug a problem or feature.

MCH1 Rack Layout

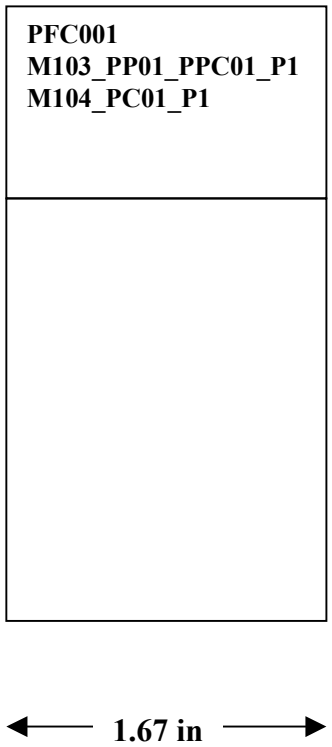


Test Stand



- Test stand area has wooden platform floor to prevent any ground faults
- Racks lowered from DAB3 last week
  - Have 5. Will need 10.
- 2 patch panels and template PCBs for 4 patch panel cards have been prepared
- Blue cable is exact type of existing BLS trigger cables
  - Cut 16 ten-foot lengths
- Preparing mock-up of cables and patch panels using rack layout specs
  - Need help!
- Need to prepare a setup to test passive electronics and cables
  - Have scope and pulse generator
  - Need help!

Labels



- Label name
- Origin
- Destination
- Pleated Foil (left): 160 x 2
  - One label for each end of 10 foot cables
    - PFC001 = Pleated Foil Cable 1 (of 160)
    - M103 = MCH Rack 103 (103-112)
    - PP01 = Patch Panel 1 (of 40)
    - PPC01 = Patch Panel Card 1 (of 2)
    - P1 = Connector 1 (of 2)
    - PC01 = Paddle Card 1 (of 80)
- BLS Trigger: 1280 x1
  - Cannot access platform end of detector
  - Will not remove or cover old labels

Remaining Concerns

- Do not have the TAB/GAB power supply dimensions and power input/output needs
- Sufficient cooling for ADF crate?
  - Dan Edmunds has supplied power estimates
- Rearrange test stand
  - Large wooden crates will be removed shortly
  - Need to place racks close to the power outlets
  - Move desks and tables elsewhere
- Mock-up – should only be 1-2 days of dedicated effort
  - What is the best way to route cables?
  - Do not know how much slack is in the BLS trigger cables
- Transition system testing
  - Full time effort. Who will do this? Needs to be done immediately after patch panel and paddle cards prototypes arrive.
    - Drives schedule for full schedule production
  - Continuity tests for starters, then pulse generator and/or Calorimeter preamp pulser to check signal path up to ADF crate
  - Involve Dan Edmunds for advanced study of signal integrity, reflection, noise, etc.